What Bottleneck?

Competitive rivalry extends beyond the major metropolitan areas with their large concentrations of business traffic into the more isolated rural areas of the country. Competition is a way of life for local exchange companies, large and small. A look at the telecommunications marketplace in Wisconsin--specifically the market areas served by GTE North, Inc.--illustrates the extent to which competition has entered the local exchange market.

Competition in Wisconsin

Competition in Wisconsin extends across services, with many of the rival firms also customers of the local exchange company as well as competitors. Pay telephone service providers, cellular companies, interexchange carriers, private network providers, cable TV companies, CPE manufacturers and alternative operator service providers compete with the local exchange carrier for the telecommunications dollars and offer products and/or services which the Wisconsin telecommunications consumer could substitute for local exchange company offerings.

Cellular Services

Cellular Service providers, for example, compete with GTE North in providing local access, local usage, intraLATA toll, pay phone service and interLATA service. While they are only less than a decade old, they have become astonishingly successful players in the telecommunications industry and have a bright future in light of their current cellular penetration rates estimated at just under 3% of the U.S. population. They have plenty of room to grow, and within the next few years, that penetration is likely to increase five-fold. Of note, that segment of the industry tracks penetration in terms of population and not households, so a 15% penetration rate actually equates to closer to 48% of households (the basis used by local exchange companies to track their penetration). In other words, even without considering other forms of wireless communications, by the end of this decade, cellular penetration should reach half the penetration rates which it has taken the LECs 75 years to achieve!

What Bottleneck?

In addition, GTE North and Wisconsin Bell (Wisconsin's other large local exchange company) are prohibited from carrying traffic across LATA borders. GTE's constraint stems from its acquisition of U.S. Sprint as reflected in its Consent Decree. Even though GTE now has no ownership in Sprint, the restriction on its local exchange companies' ability to carry interLATA traffic remains in force. Wisconsin Bell and its fellow regional operating telephone companies, formerly part of the Bell System, are restricted because of the Modified Final Judgement associated with their divestiture from AT&T.

Cellular carriers are not so constrained. Consequently, they can offer customers service packages which incorporate both intra and interLATA services while the two major local exchange companies serving the state cannot.

Adding further complexity, cellular carriers--in addition to being competitors to the local exchange companies--are customers. This is true of competitors in other aspects of the business as well. In the cellular case, because all customers do not subscribe to cellular service, cellular carriers must connect to the local exchange company's public switched network to terminate their traffic. Likewise, if a landline customer wants to dial a cellular customer, there must be a connection through the local exchange company.

The precise impact of cellular carrier completion on GTE is difficult to determine. On one hand, these carriers may generate revenue for the local exchange company from additional minutes of use and the related access charges. On the other hand, they siphon off revenues which might have been generated through a pay phone call, for example.

Even price comparisons are difficult because the local exchange companies have complex, multi-dimensional pricing structures and artificially designated rate elements. But for both residential and business customers cellular can be a very competitive offering right now. In fact, it can already be cheaper to be a cellular customer rather than a customer of the LEC.

What Bottleneck?

Figure 1 shows the total monthly local service billing for various levels of local minutes of use[1]--from zero to 220--from two Wisconsin cellular companies and from GTE North. The GTE North local rates show examples for residential, business and multi-line local service customers. Note that for low volume single line business users of up to about 40 minutes of use per month, cellular is a cheaper service than even the measured option of GTE North.

Of perhaps even greater interest, it is just as cheap for low volume residence customers currently on flat rate service from GTE North to discontinue their service from the LEC and use the cellular alternative.[2]

For the local exchange carrier's single line business customer with flat rate service, cellular is a less expensive alternative up to about 80 minutes of use. For the multi-line business customer, the price advantage of cellular extends to 100 minutes of use and for the flat rate customer, it goes up to about 140 minutes. This makes cellular a very attractive local service substitute for many business customers.

Closely akin to cellular service is the development of an improved technology known as Personal Communications Networks, or PCNs. PCNs use a form of low power microcellular technology that allows wireless communications in both residential and business applications. A number of regulatory and technical issues, currently under FCC scrutiny, still surround the PCN technology.

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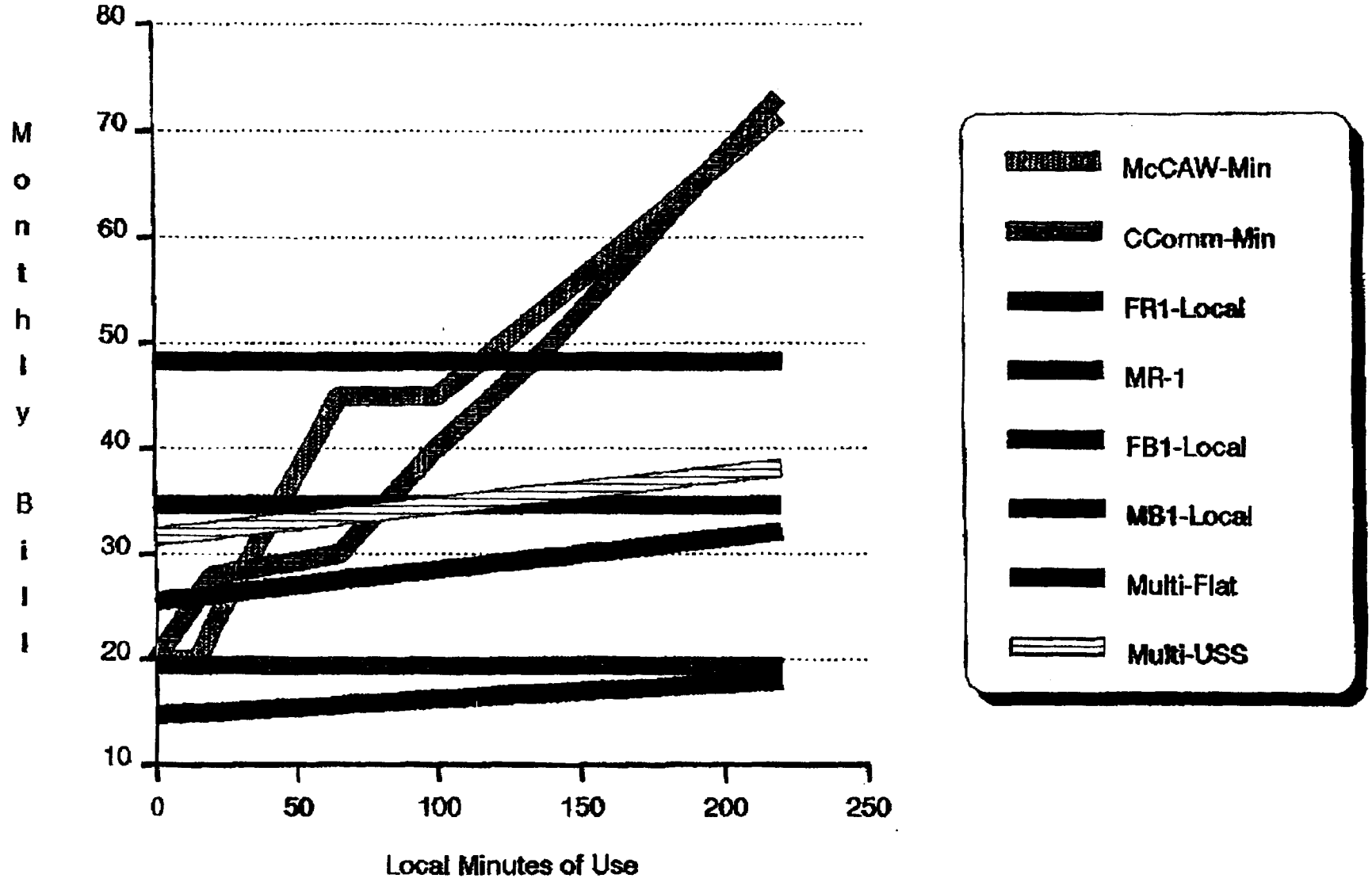
[1] Note: The definition of local is based on the LEC's definitions as contained in its tariffs. Cellular tariffs have a different definition of "local".

[2] For both residence and business customers, the MOU comparison may be misleading. Due to the skewed distribution of telephone usage, these low volume customers can account for 10% to 15% of LEC customers.

Figure 1

Cellular v GTE Local Rates



3 - a

While the matter of spectrum allocation is the jurisdiction of the FCC, the emergence of such a wireless technology will have a most definite bearing on the level of competition at the state level. By applying PCN technology and connecting with cellular, microwave, other private networks, interexchange carriers, or cable TV distribution networks, it becomes increasingly possible to provide a very comprehensive substitute for the services provided by a local exchange carrier.

Interexchange Carriers

Interexchange carriers represent another competitor for local exchange service since they offer services that are substitutes for services provided by GTE North and other local exchange companies. And they also offer services which complement local exchange services.

In Wisconsin today, 10XXX competition is allowed. Additionally, "incidental" intraLATA traffic is allowed to be transported over carrier-provided services. The Wisconsin Public Utility Commission is already considering, as are many other state commissions, the issue of full intraLATA competition.

To assess interexchange carriers as competitive alternatives to the local exchange companies, it is helpful once again to look at price comparisons. It must be noted that AT&T has reduced its prices below those of the other major interexchange carriers, effective in October of 1990. Prior to that time, AT&T's prices would have been very similar to those of MCI and Sprint.

No doubt AT&T is positioning itself for the eventual authorization of intraLATA competition in the state. In any event, the impact of AT&T's price reduction is to make its prices more competitive with those of GTE North in all three time-of-day pricing periods. In the day period, the point at which a call carried by AT&T becomes cheaper to a customer that the corresponding call carried by GTE north has been reduced from approximately 100 miles

to approximately 35 miles. In the evening period, the crossover is now about 40 miles for AT&T. The crossover for the night rate is approximately 100 miles. Figure 2 illustrates this price comparison for a four-minute call.

Whether the other interexchange carriers will match these price reductions remains to be seen: however if the objective is to be positioned for intraLATA competition, the answer will be "yes". Clearly, though, for longer haul calls, competitive alternatives are attractive even now.

The competition from interexchange carriers becomes even stronger when AT&T's MegaCom offering--a switched service aimed predominantly at large business users--is analyzed. The crossover point there drops from 35 miles down to 11. While it is true that MegaCom is accessed by a special access connection, it is a switched service, just as GTE North's toll is.

This competitive rivalry for large volume business customers' traffic between the local exchange companies and the interexchange carriers really begins at the first point of switching. That is where today's large volume customer has a choice. Services like AT&T's MegaCom are direct substitutes for the switched access services that GTE North supplies to AT&T. Minutes that otherwise might be handled by GTE North and routed to AT&T over the switched network are diverted to a special access arrangement to reach AT&T's switched service.

Interexchange carriers have a further advantage in that they are able to provide customers with both interLATA and intraLATA services. The local exchange carriers are precluded from doing so. In Wisconsin, GTE North and the other local exchange companies do not have an exclusive franchise for intraLATA traffic. That market has competition if the traffic is "incidental" and the commission could let the interexchange carriers into the intraLATA market for full competition.

When looking at interexchange competition, it is important to note that these inter-exchange carriers are very large corporations with considerable market power. AT&T, the largest of the three carriers and one of the largest corporations in America, appears

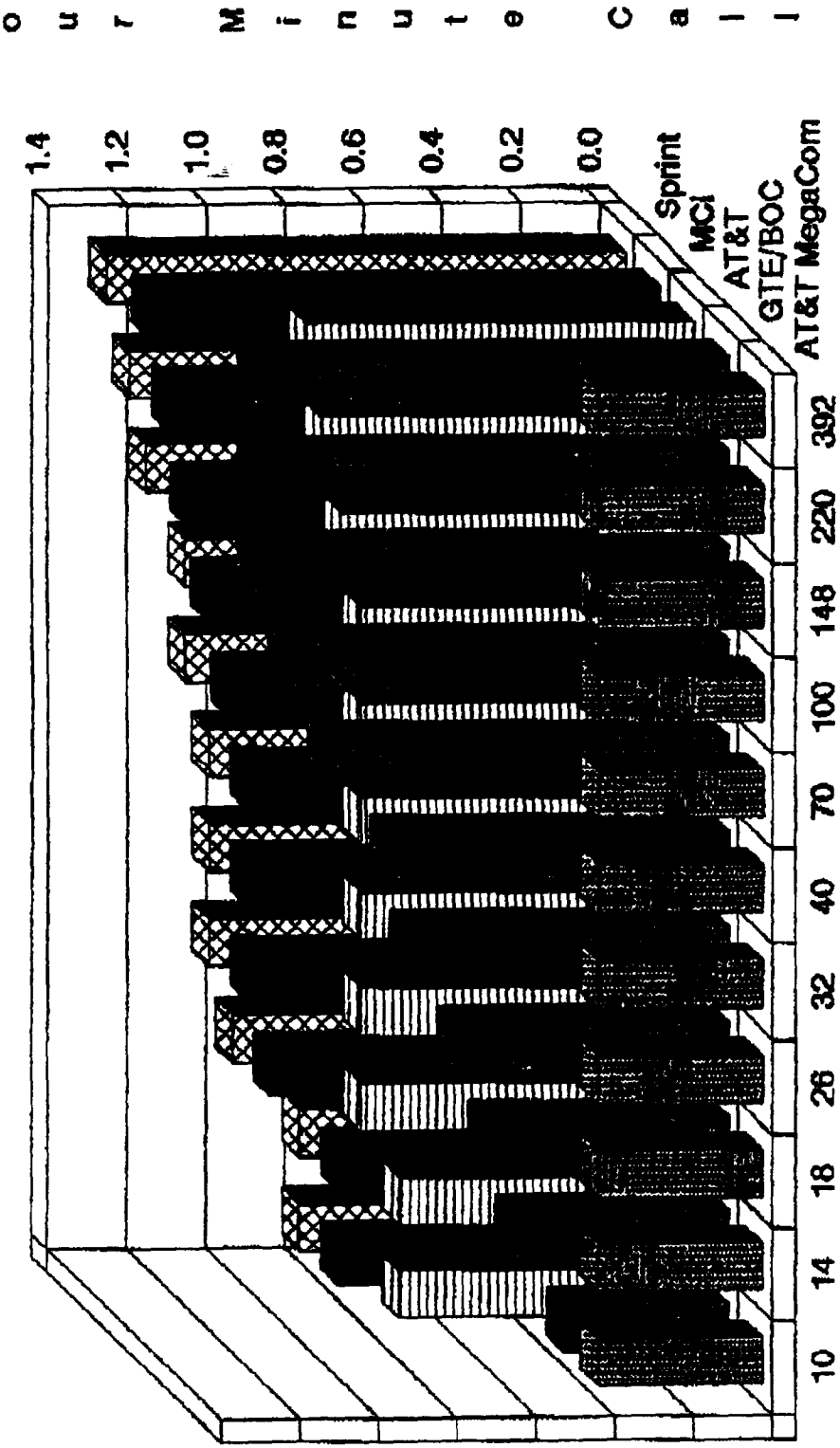


Figure 2

GTE Toll v. IXC Prices

4-a

to be positioning itself for explicit intraLATA competition with a targeted market far beyond the large volume business customers. Based on the intense rivalry among players in this market, it is reasonable to expect that the other interexchange carriers would not be far behind.

Consequently, what is already intense competition with local exchange companies thanks to offerings like MegaCom is likely to get even more intense.

Other Forms of Network Competition

Besides the competition from cellular and interexchange carriers, local exchange companies face competition for network services from private networks and cable TV operations. Private networks represent the telecommunications infrastructure built explicitly to replicate local exchange and long distance services outside the traditional telecommunications company. Some of these private telecommunications networks are designed for the exclusive use of one customer. Others belong to competitors who have developed businesses to provide an alternative to the local exchange company--the so-called Competitive Access Providers.

Private Networks

Wisconsin has a number of private networks already. Probably the best known of these is NorLight, a partnership of four electric and gas utilities. NorLight has a 790 mile fiber optic network throughout the state and offers the latest in digital services. NorLight is in the telecommunications business, competing directly with Wisconsin's local exchange companies and with interexchange carriers as well, offering substitute services.

Competitive Access Providers

Competitive Access Providers also compete against local exchange companies in Wisconsin. Digi-Net Communications has a four mile fiber optic network in Milwaukee nearing completion and has operated a 91-mile fiber optic network between Milwaukee and Chicago for several years. By pricing its services between 25-35% below those of the local exchange company, Digi-Net works to achieve market penetration. In other states, once this market share is achieved, the price differential has been reduced to

somewhere between 10-20% below the local exchange company's price. The initial rivalry if for POP to POP transport, business to POP transport and for high capacity business services.

Other alternate local transport companies, such as Metropolitan Fiber Systems, have made no secret of their desire to enter the switched services market as well. It is likely that these companies would first enter the switched segment via a Centrex-type arrangement which they would target for medium to large business customers.

Keep in mind that these companies are also certified interexchange carriers and have interconnections with other private networks. To a customer, they look and act much like an interexchange carrier. And they are quick to use as a marketing advantage the fact that they are not bound by tariffs so they can give their customer flexible, custom-tailored services.

CAPs also offer opportunities for interconnection with cellular and personal communications network companies. This gives them the potential of extending the competitive nature of their service offerings to residential customers in the not too distant future.

Even in GTE's largely rural and suburban territories in Wisconsin, these private networks already exist. Probably the best known is the network used by the State of Wisconsin for its traffic. All agencies of the state as well as local governments, school boards, etc. can

interconnect with this network. While capacity on this network is not available for resale to the public at large, once again this private network clearly is a substitute for services, including local services, provided by GTE, Wisconsin Bell and other carriers as well.

Once again, these competitors are segmenting the market and homing in on targeted market segments. They are making significant inroads in those market segments; the competition is very real.

Cable TV Providers

In Wisconsin, cable TV companies can provide substitute services to those provided by GTE and the other local exchange companies. Warner Cable Communications operates a cable television franchise in Milwaukee. These high capacity services are available to both interexchange carriers and end users over a fiber network built specifically for the purpose of telecommunications. These dedicated or special access facilities are in competition with the same services offered by GTE and the other local companies. A recent competitive case in Wausau involving Jones Cable indicates a troubling aspect of competition that local exchange companies face. That is the potential for predatory pricing by competitors. When the City of Wausau and the County of Marathon recently put out an RFP to construct wideband facilities between their two locations, GTE submitted a proposal. Jones Cable offered the facilities between the two locations **at no** charge, apparently because the costs are being recovered from some other source of revenue.

This appears to be a straightforward case of cross-subsidization of a competitive service. It certainly is not an example of bidding to recover the incremental costs of the facilities plus some level of contribution to Jones Cable's common costs. Their competitive strategy indicates that Jones Cable believes it is sufficiently important to offer this service in competition with the local exchange company that they are willing to do so at a loss.

What Bottleneck?

While not yet operational in Wisconsin, a system has been developed and is currently being marketed by AT&T and by Optical Networks International which is promoted as "a model for the cable industry's evolution." The network, as shown in Figure 3, depicts the cable system, perhaps in conjunction with a CAP, as provider of voice data, and video services to both residential and commercial users. **Absolutely critical note should be made that no LEC appears in their infrastructure architecture!** In the promotional material, the following statement appears: The design solutions include replacing the local exchange company with a direct connection from the inter-exchange carrier to the cable TV network." If this is what it feels like to be a "bottleneck" or monopoly, it's not a comfortable feeling when a LEC is currently prohibited by the Cable Act from entering the video business!

CPE Manufacturers

As with other forms of competition, CPE is both a complement and a substitute for the network services provided by GTE and other carriers as well. CPE is necessary for customers to reap the benefits of a local exchange network and in many ways strongly complements the services provided by GTE and other local exchange carriers. However, many of the features on today's telephones compete directly with services offered by the local carriers in the network itself. Features such as call waiting, the most popular of the vertical services offered by GTE, and last number redial, automatic redial on busy and speed dialing are all available in today's vast selection of feature-rich CPE.

The CPE market is extraordinarily competitive. Both single and multiple line telephones ar sold in a variety of outlets. From a local exchange perspective, the concern is with the features which these telephones offer. Price comparisons, feature for feature, show that today's CPE is extremely competitive with equivalent features from the local exchange network, and in many cases, less expensive than the LEC-offered services.

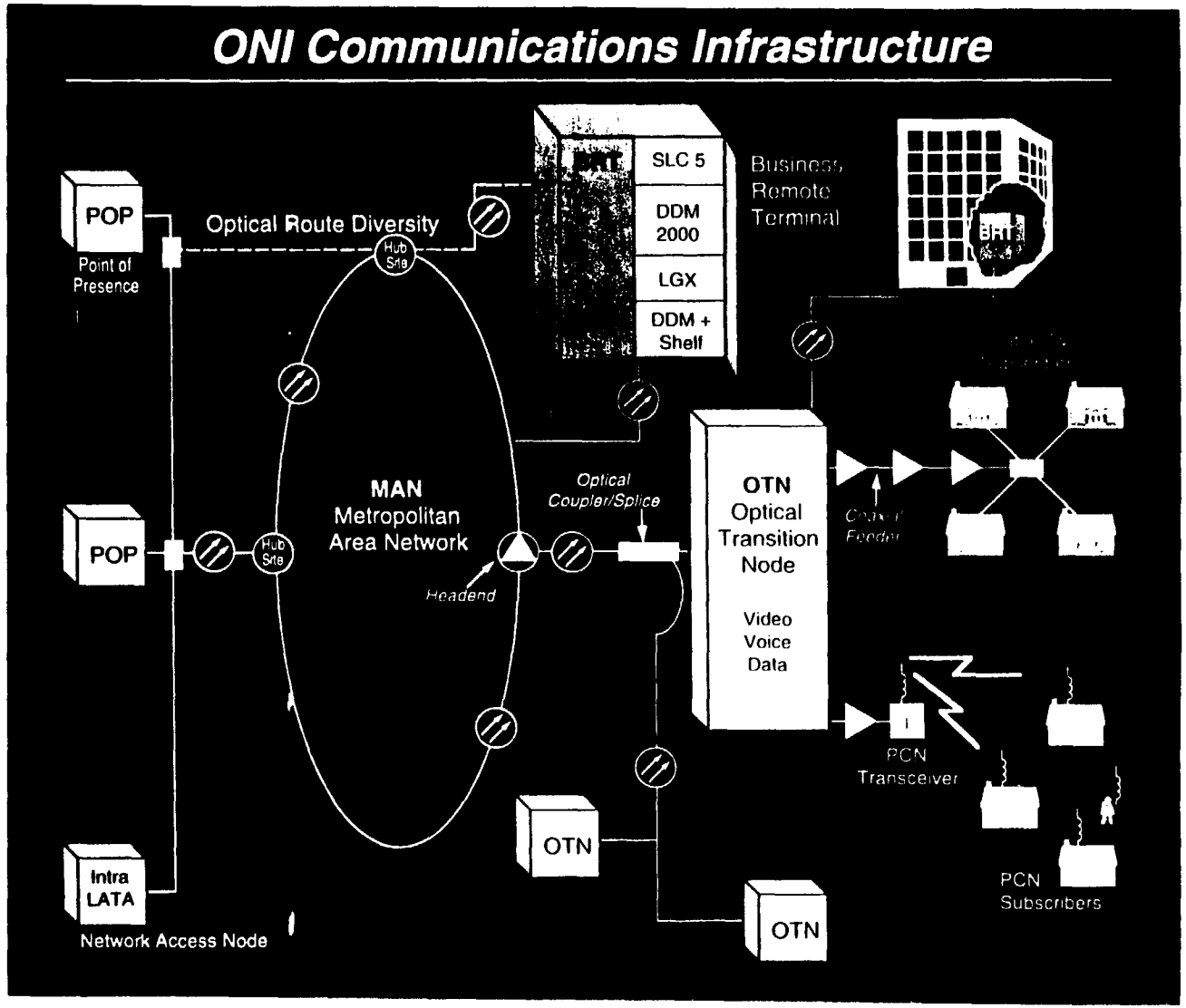
Communications Infrastructure

Fiber optic systems being installed today are improving system reliability, signal quality, and bandwidth capacity for broadband video services presently marketed to cable TV subscribers.

By deploying fiber optic platforms that take the optical path ever closer to the subscriber's home, cable operators are also laying a foundation for offering future services that extend beyond video entertainment

ONI's Communications Infrastructure is a model for the cable industry's evolution. This network model depicts the cable system as provider of voice, data, *and* video services, to both residential and commercial users.

Optical Networks International and AT&T have committed substantial resources to the development of products and systems that will enable the cable industry to prosper in the coming years. The Communications Infrastructure is our vision of the cable industry's future.



While features are not perfect substitutes, they are sufficiently similar to serve the purpose of reducing the market power of GTE and other local exchange carriers. And the CPE can be configured and priced to reflect a wide variety of customer demands.

CPE for Large Business Customers

With today's digital switching, multiplexing, microwave, satellite and fiber-optic transmission, the cost of switching and trunking has decreased dramatically relative to the cost of network access. Consequently, it has become more economical to provide service using relatively shorter loops and more subscriber line carrier and trunking. Switching and multiplexing have been moved closer to the customer--largely though increasing utilization of PBXs.

PBXs are acknowledged as a type of highly competitive CPE, but a convincing case can also be made that a PBX is, in effect, a new type of end office owned privately by a user. A PBX is capable of performing many of the same functions that a central office switch owned by a local carrier does.

One outgrowth is that it no longer takes a Shared Tenant Service offering to bring the same benefits to customer, although these services are growing in popularity as mechanisms to provide connections directly to interexchange carriers and, or private "bypass" facilities. They differ from the local company only by degree and scale. The Shared Tenant provider may see the offering as less an issue of competition and more an issue of enhancing his primary real estate or other business. And the offering is limited only to the tenants. Yet, there again is competition for a subset of the local exchange telecommunications market and a viable alternative for concentrating traffic and reaping the benefits of high volumes that today's technology offers.

What Bottleneck?

Financial Consequences to the LEC

Clearly, competitive alternatives to the local exchange companies already exist. Is this competition harmful to the local exchange companies? While, in the case of GTE's network, lines and minutes of use continue to grow, growth rates undoubtedly would have been higher had competitive alternatives not existed. Competitors are offering services which are being substituted for "in kind" services available through the local company. Yet competitors also are generating revenues through their increased usage of the local exchange network and their payment of access charges.

To truly "answer" the question, one would have to perform several simulations as to what the network traffic would have looked like without the competitive alternatives and compare them to the situation as it exists today. Clearly, like opportunity costs, this type of information does not exist on the books of any company.

Thus the simulation approach would be the only rational approach to answer what might have been. GTE has not done such a study for a number of reasons. The most significant is that it requires the cooperation of a number of competitive rivals: cellular carriers, alternative local transport companies, interexchange carriers, etc. Much of the needed data is closely guarded because of the competitive nature of the relationship.

However, based on information GTE does have, there is evidence of the impact of some of the competition such as in the toll market. Despite line growth of more than 25% among business customers of GTE with more that $200 in billings a month, more than 40% of these valued customers are showing decreases in minutes of use growth over a recent two-year study period. Clearly, attractive alternatives exist today.

Price is a key factor, but it certainly is not the only one. And drawing on a textbook model of perfect completion is not the appropriate market structure to apply to the synergies and rivalries occurring in the telecommunications industry.

Other factors include the ease of dealing with a single integrated provider for telecommunications services--a priority item among the largest and most sophisticated customers--and one which disadvantages local exchange companies who are not permitted to cross LATA boundaries.

The importance of price competition in the industry today calls for increased pricing flexibility to be granted to the local exchange companies today. GTE faces rivalry for virtually all of the products and services which it offers currently. That competition is likely to increase significantly in the future. The FCC is on record as looking at ways to expand competition at the local exchange level. The capability and interest to provide an alternative public switched network exists today. This is clearly a crucial issue not only for the local exchange companies but for the sate regulatory commissions as well. To compete in the increasingly competitive markets, local exchange companies require pricing flexibility and a rebalancing of the rate structure. New technologies must play strongly in the decisions being made.

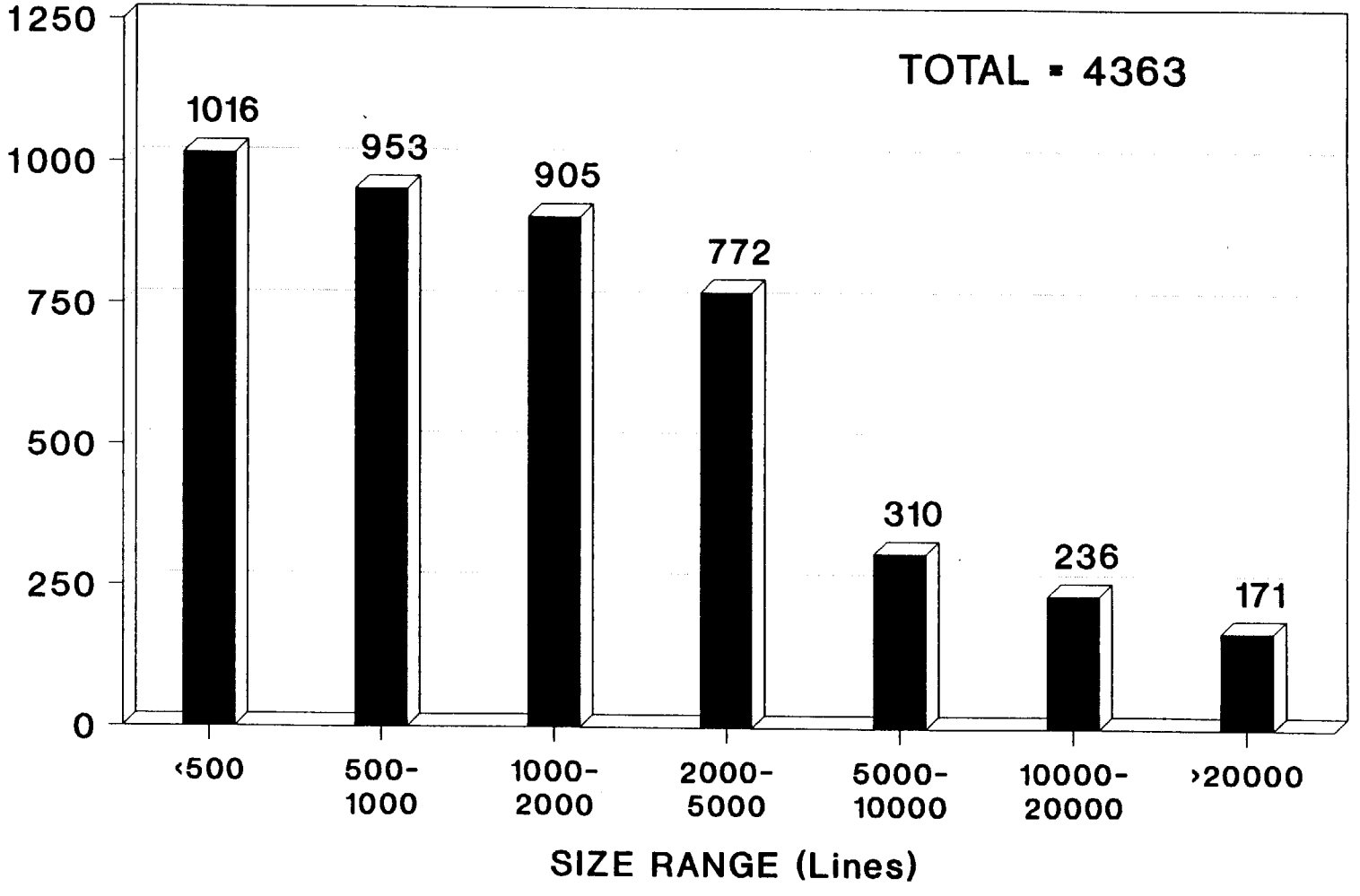
It is clear that GTE North and its fellow local exchange companies do not have a monopoly position in any of their market segments--even in some of the more rural areas of Wisconsin. It is apparent that today's local exchange carriers' competitors are defining the market by targeting their in-roads and building on the advantages to concentrate traffic that today's technology brings. LECs are quite simply not the monopolies they are alleged by some parties to be. Public policy must take such competitive realities into consideration when making decisions affecting local exchange carriers.[3]

[3] For a more comprehensive treatment of the subjects discussed in this article, see Edward C. Beauvais, "Local Exchange Service: Where Is Competition Taking Us? or Bottleneck? What Bottleneck? " • Presented to the 23rd Annual Conference of the Institute of Public Utilities, Michigan State University, Williamsburg, Virginia, December 11, 1991; publication forthcoming.

D

ATTACHMENT D

GTE
NUMBER OF SERVING WIRE CENTERS



AS OF 10/29/92

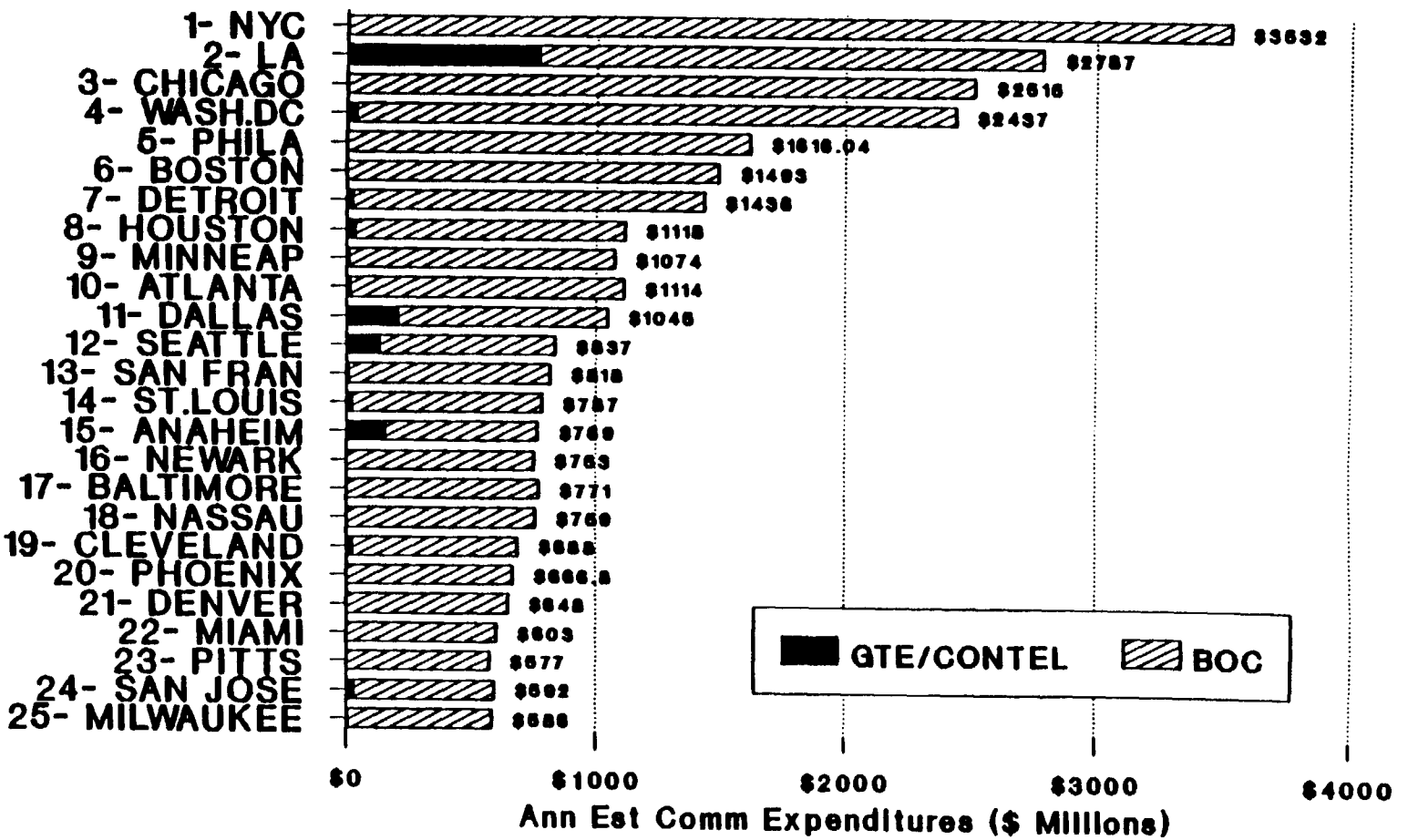
E

ATTACHMENT E

GTE/CONTEL MARKET PRESENCE

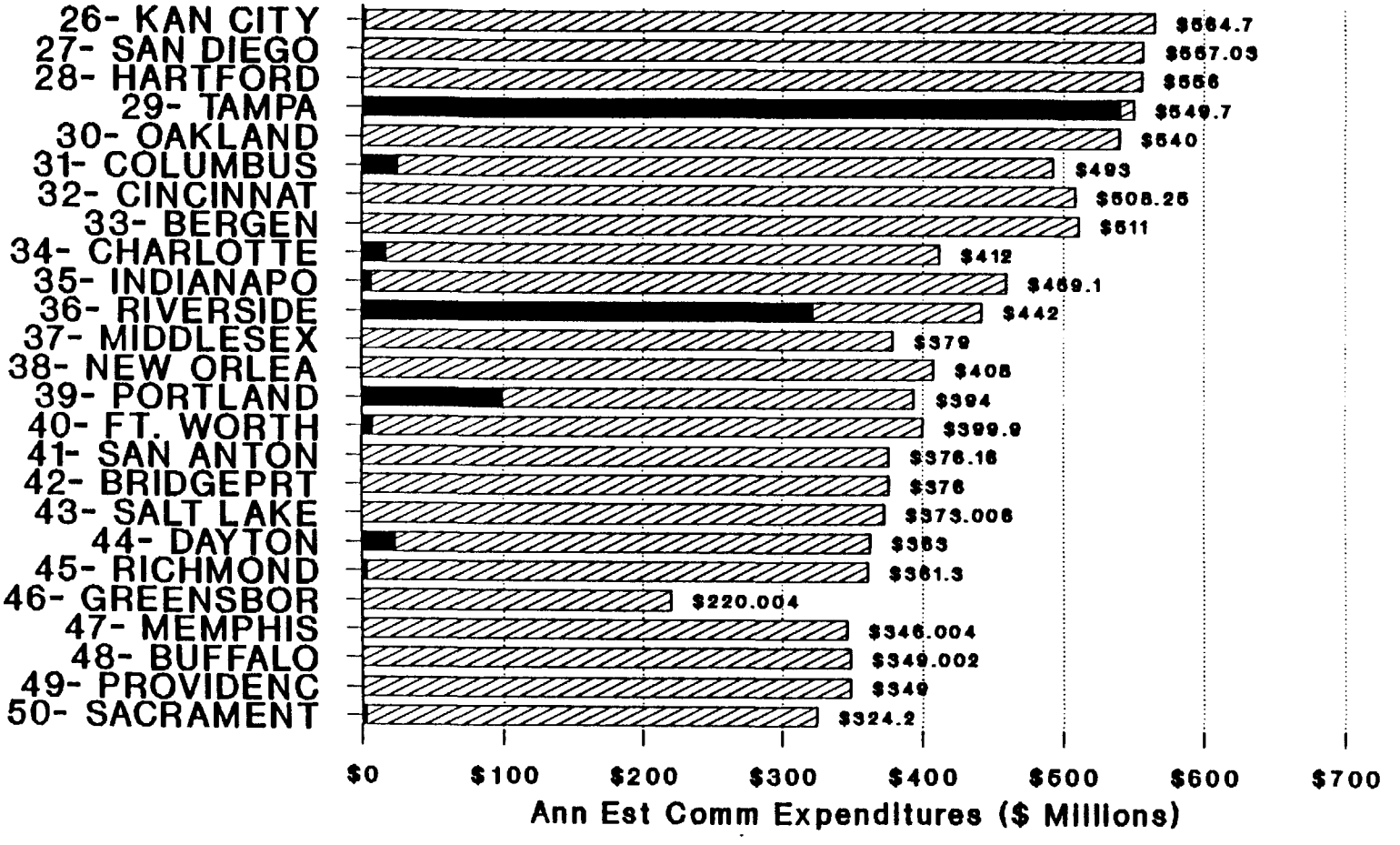
TOP 25 MSAs

(in descending order)



GTE/CONTEL MARKET PRESENCE

BOTTOM 25 MSAs OF TOP 50



F

ATTACHMENT F

GTE MECHANIZED OPERATING SUPPORT SYSTEMS
AND USE BY GTE/CONTEL ENTITY

System category & name	GTE FL	GTE SO	GTE NO	GTE SW	GTE CA	GTE NW	GTE HI	Contel Convert	
Order Entry:									
* SORCES	X	X	X	X		X	X	92/93	
ASOS/SOLAR					X				
CMSS	4Q92	2Q93	4Q93	3Q93	4Q94	4Q94	1Q94	94/95	
Billing:									
* UMS - Usage	X	X	X	X	X	X	X	92/93	
* CRB - End User	X	X	X	X		X	X	92/93	(Note 1)
BMS/BPR - End User					X				(Note 1)
* TOLL	X	X	X	X	X	X	X	92/93	(Note 1)
* BVT	X	X	X	X	X	X	X	92/93	
CBSS - End User	X	4Q92	3Q93	4Q93	4Q93	2Q93	4Q92	94/95	
CABS - Access	X	X	X	X	X	X	X	92/93	
Repair & Dispatch:									
* TAS	X	X	X	X	X	X	X	92/93	
AWAS	X	X	X	X	X	X	X	92/93	
Facilities assignment and records:									
* MARK	X	X	X	X	X	X	X	92	
CNAS	X	X	X	X	X	X	X	92/93	

* Indicates that the system has a common base with local modifications. For example, CRB actually has 14 versions in place.

Note 1: To be replaced by CBSS.

Contel integration is a two step process: conversion to existing GTE systems followed approximately two years later by conversion to newest GTE system.

SYSTEM NAMES:

SORCES: Service office Record and Computer Entry System
ASOS: Automatic Service Order System
SOLAR: Service Order Load and Retrieval System
CMSS: Customer Marketing and Service System
UMS: Universal Measured Service
CRB: Customer Records and Billing
BVT: Billing Voucher and Treatment
CABS: Carrier Access Billing System
TAS: Trouble Administration System
AWAS: Automated Work Administration System
MARK: Mechanized Assignment and Record Keeping
CNAS: Circuit Network Administration System
CBSS: Customer Billing Services System